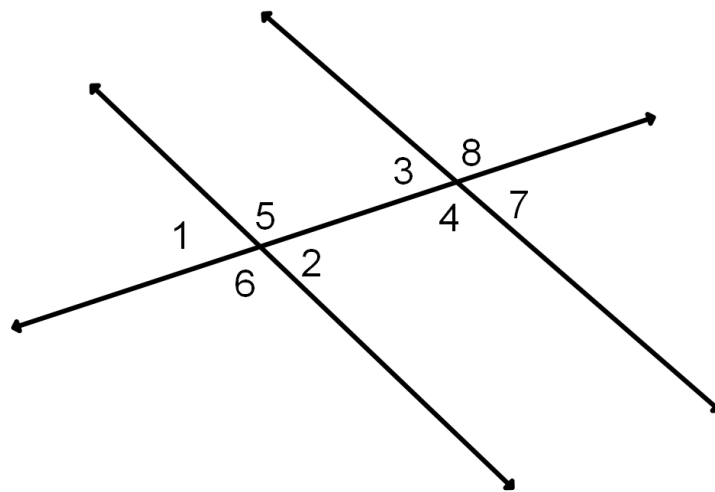


Warm-up:
Monday,
November
15, 2010



1) $\angle 1$ and $\angle 7$ are _____

2) $\angle 6$ and $\angle 7$ are _____

3) $\angle 4$ and $\angle 2$ are _____

4) $\angle 3$ and $\angle 2$ are _____

Geometer's Sketchpad Activity

Warm-up: Tuesday, Nov. 16, 2010

From yesterday's activity....

What did you notice?

For 2 parallel lines cut with a transversal:

Alternate exterior angles are congruent

Alternate interior angles are congruent

Same-side interior angles are supplementary

Same-side exterior angles are supplementary

Corresponding angles are congruent

congruent

supplementary

complementary

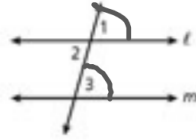
Corresponding Angles Postulate:

If 2 parallel lines are cut by a transversal, then corresponding angles are _____

We can use this postulate to prove the next 3 theorems

1) Proving the Alternate Interior Angles Theorem

Given: $\ell \parallel m$
Prove: $\angle 2 \cong \angle 3$



S	R
① $\ell \parallel m$	① Given
② $\angle 1 \cong \angle 3$	② Corr. \angle s Post.
③ $\angle 1 \cong \angle 2$	③ VAT
④ $\angle 2 \cong \angle 3$	④ Subst. / Trans

Alternate Interior Angles Theorem:

If 2 parallel lines are cut by a transversal, then alternate interior angles are _____

2) Proving the Alternate Exterior Angles Theorem

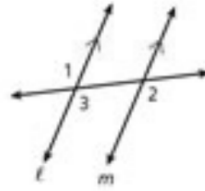
Given: $\ell \parallel m$
Prove: $\angle 1 \cong \angle 2$

S

~~B~~

R

~~S~~



1. $\ell \parallel m$	1. Given
2. $\angle 3 \cong \angle 2$	2. CAP
3. $\angle 1 \cong \angle 3$	3. VAT
4. $\angle 1 \cong \angle 2$	4. Subst./Trans.

Alternate Exterior Angles Theorem:

If 2 parallel lines are cut by a transversal, then alternate exterior angles are _____

3) Proving the Same-Side Interior Angles Theorem

Given: $r \parallel s$
 Prove: $m\angle 1 + m\angle 2 = 180^\circ$



- | S | R |
|---------------------------------------|---|
| ① $r \parallel s$ | ① Given |
| ② $\angle 1 \cong \angle 3$ | ② CAP |
| ③ $m\angle 1 = m\angle 3$ | ③ Def. of \cong \angle s |
| ④ $m\angle 2 + m\angle 3 = 180^\circ$ | ④ Def. of sup \angles Linear Pair Thm |
| ⑤ $m\angle 2 + m\angle 1 = 180^\circ$ | ⑤ Substitution |

Same-Side Interior Angles Theorem

If 2 parallel lines are cut by a transversal, then same-side interior angles are _____

Summary of Special Angle Pairs formed by parallel lines

Congruent	Supplementary
Corresponding Alternate Interior Alternate Exterior Vertical	Same-side Interior Same-side Exterior Linear Pairs

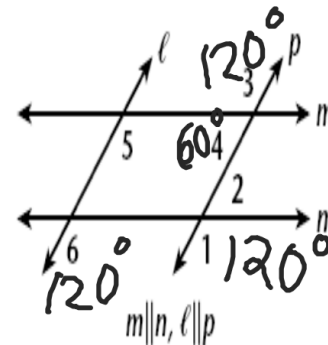
Exercises *These are on your worksheet...*

1. a. Which of the numbered angles are corresponding angles?

$\angle 1$ and $\angle 6$, $\angle 5$ and $\angle 4$

- b. Which of the numbered angles are same-side interior angles?

$\angle 5$ and $\angle 4$

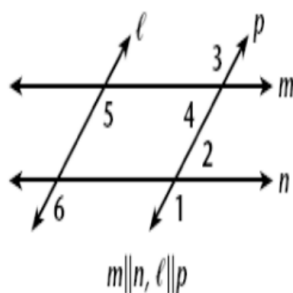


2. If $m\angle 1 = 120^\circ$ in the diagram above, find $m\angle 3$, $m\angle 4$, and $m\angle 6$. _____

$$m\angle 3 = 120^\circ$$

$$m\angle 4 = 60^\circ$$

$$m\angle 6 = 120^\circ$$

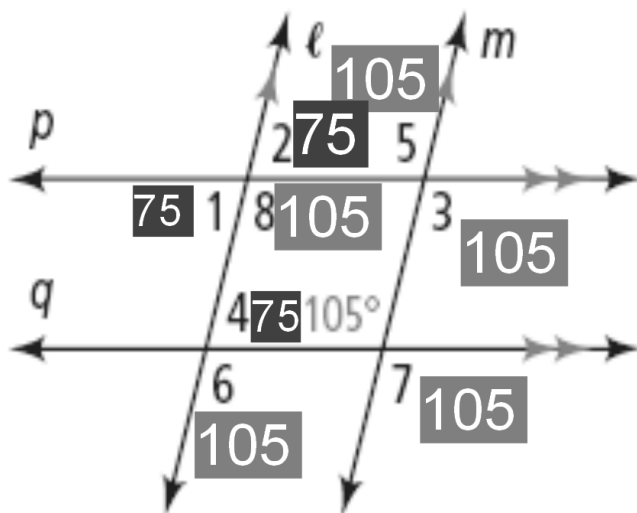


3. In the diagram above, find $m\angle 4$ if $m\angle 4 = (2x - 20)^\circ$ and $m\angle 5 = (3x + 10)^\circ$. $m\angle 5 = 124^\circ$
 $m\angle 4 = 56^\circ$

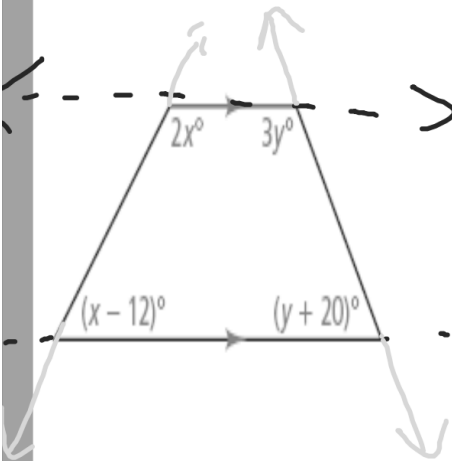
$$\begin{aligned}
 180 &= m\angle 4 + m\angle 5 \\
 180 &= (2x - 20) + (3x + 10) \\
 180 &= 5x - 10 \\
 190 &= 5x \\
 38 &= x
 \end{aligned}$$

• Finding Measures of Angles

Identify each angle measure.



• Using Algebra to Find an Angle Measure



The bases of a trapezoid are parallel / perpendicular.
(circle one)

Use the Same-Side Interior Angles Theorem to complete each statement, and then solve.

$$2x + \underline{x - 12} = 180$$

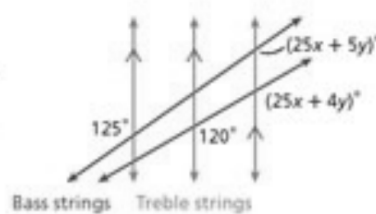
$$3y + \underline{y + 20} = 180$$

$$x = 64$$

$$y = 40$$

Music Application

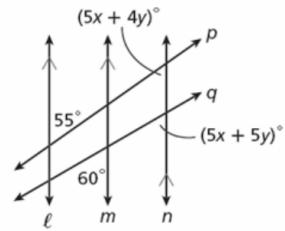
The treble strings of a grand piano are parallel. Viewed from above, the bass strings form transversals to the treble strings. Find x and y in the diagram.



$$\begin{array}{r}
 125 = 25x + 5y \\
 + \quad -120 = -25x + 4y \\
 \hline
 5 = y
 \end{array}$$

$$\begin{array}{r}
 125 = 25x + 5y \\
 125 = 25x - 4y \\
 \hline
 100 = 25y \\
 4 = y
 \end{array}$$

Find x and y in the diagram.



$$55 = 5x + 4y \text{ (Alt int } \angle\text{s are congruent)}$$

$$- \underline{60 = 5x + 5y} \text{ (Corresp. } \angle\text{s are congruent)}$$

$$-5 = -y$$

$$5 = y$$

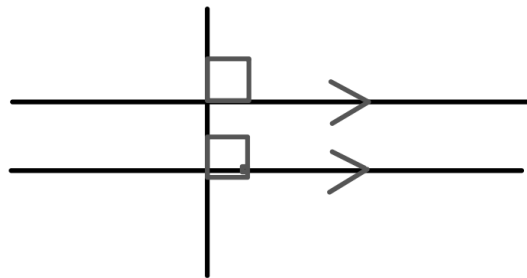
$$55 = 5x + 4(5)$$

$$55 = 5x + 20$$

$$35 = 5x$$

$$7 = x$$

Draw a picture of a transversal perpendicular to two parallel lines. Label all angle measurements.



Finish the statement below:

If a transversal is perpendicular to two parallel lines, then _____

all angles formed are 90 degrees

HW=

3.2 Practice and
Problem Solving